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## PEOPLE'S REPUBLIC OF CHINA SCIENTIFIC ABSTRACTS

No. 171

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SCIENTIA GEOLOGICA SINICA

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TITLE: "The Compiling of P Wave Travel Time Table in China"

SOURCE: Peking TI-CHIH K'O-HSUEH [SCIENTIA GEOLOGICA SINICA] in Chinese No 1,  
Jan 77 pp 6-25

TEXT OF ENGLISH ABSTRACT: This paper describes the computational methods and results of a P wave travel time table compiled for 1973. Based upon the data available from 298 earthquakes and artificial blasts occurring in China and its neighboring regions and a large number of P wave arrival time data recorded by stations situated at home and abroad, the P wave travel time table is constructed using the statistic and iterative method to directly obtain four P waves from various depths (0, 15, 40, 50 km). Examining the P wave travel time for a good many earthquakes and comparing the results with those received from some

[continuation of TI-CHIH K'O-HSUEH No 1, Jan 77 pp 6-25]

regional stations or macroscopic observations, the authors show that the table gives good results in the determination of basic seismic source parameters, including the origin-time of an earthquake and its location (longitude, latitude and depth). Moreover, the table is especially significant in determining focal depths in view of the complexity of geologic structures in China which leads to the variation in the velocity of seismic waves while propagating in various directions and different regions. Therefore, the travel time table presented here for various depths of P wave is to a certain degree superior to that calculated by the method of velocity inverse.

AUTHOR: LIU Ch'un [0491 2797]  
CHU Hsiang-yuan [2612 3276 0337]  
YEH Su-chuan [0754 4790 1227]

ORG: None

TITLE: "A Palaeomagnetic Study on the Cave-Deposits of Chou-k'ou-tien, the Locality of Sinanthropus"

SOURCE: Peking TI-CHIH K'O-HSUEH [SCIENTIA GEOLOGICA SINICA] in Chinese No 1, Jan 77 pp 26-33

TEXT OF ENGLISH ABSTRACT: This paper gives the results of palaeomagnetic study on the main cave-deposits (the 4th to the 10th layers) of Chou-k'ou-tien, the locality of Sinanthropus. The major conclusions are as follows:

1. The remanence of 28 oriented samples were measured by an IAM-24 type astatic magnetometer. In order to remove the secondary magnetization, magnetic cleaning was done in a 150 Oe. A. C. field. Before and after the demagnetization all samples show normal polarity.
2. By comparing the available data to the Geomagnetic Time Scale, it is suggested that the age of Sinanthropus is less than 0.69 m.y.

[continuation of TI-CHIH K'O-HSUEH No 1, Jan 77 pp 26-33]

3. The direction of remanence measured from these samples is:  $D_Y = 7^\circ$ ,  $J_Y = 54^\circ 50'$ . The ancient north magnetic pole was located near  $82^\circ 50'N$ ,  $241^\circ 46'E$ . Hence at the time of Sinanthropus existence, Chou-k'ou-tien was located at  $35^\circ 21'N$  latitude, much further south than that of today.

AUTHOR: CH'ENG Kuo-liang [4453 0948 5328]  
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ORG: None

TITLE: "Discussion On the Age of Homo Erectus Yuanmoensis and the Event of Early Matuyama"

SOURCE: Peking TI-CHIH K'O-HSUEH [SCIENTIA GEOLOGICA SINICA] in Chinese No 1, Jan 77 pp 34-43

TEXT OF ENGLISH ABSTRACT: Magnetic cleaning technique was used to compile the magnetostratigraphic map of the Yuanmo Group, Yunnan province. By comparing the magnetostratigraphy with the magnetic polarity time scale, the authors have drawn the following conclusions:

1. The age of Homo erectus yuanmoensis has been dated at 1.63-1.64 m.y.
  2. The Yuanmo Group was deposited at a time span of 1.53-3.12 m.y.
- These conclusions agree reasonably well with the data obtained from both mammalian fossils and depositional rate.

[continuation of TI-CHIH K'O-HSUEH No 1, Jan 77 pp 34-43]

As judged from the magnetic zone of Yuanmo Group, both the Gilsa and the Olduvai may with confidence be regarded as two separate and independent events in spite of the short interval, namely 0.01-0.02 m.y. separating them.

As far as we know, the Yuanmo Group is the first geologic unit in the world that records the two events concerned.

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TITLE: "Remanence of Red Beds From Lin-chou, Hsi-tsang [Tibet] and the Northward Movement of the Indian Plate"

SOURCE: Peking TI-CHIH K'O-HSUEH (SCIENTIA GEOLOGICA SINICA) in Chinese No 1, Jan 77 pp 44-51

TEXT OF ENGLISH ABSTRACT: The remanence measured from the red beds of Lin-chou, Hsi-tsang [Tibet] indicates a gradual eastward deviation in magnetic declinations of samples collected from the bottom upward. It is deduced from this fact that during the formation of red beds the basin was subjected to a counterclockwise tectonic movement. Moreover, a method is proposed here by which the changes in latitudinal distance between two plates can be calculated, and the 3000 km northward movement of the Indian subcontinent since Late Cretaceous as determined by this method gives an average rate of relative movement between the Indian and Eurasian Plates of 5 cm/yr.

AUTHOR: None

ORG: Experimental Seismology Group, Institute of Geology, Academia Sinica

TITLE: "Migration of Earthquakes and the Development of Fractures"

SOURCE: Peking TI-CHIH K'O-HSUEH [SCIENTIA GEOLOGICA SINICA] in Chinese No 1, Jan 77 pp 52-64

TEXT OF ENGLISH ABSTRACT: Earthquakes are not only associated with faults in their spatial distribution but also migrate from place to place according to certain rules in the course of time. It has been established that the spatial distribution reflects the degree of concentration of tectonic stresses and release of strain energy, while the migration of earthquakes indicates the variation of the tectonic stressfield. In general, the spatial distribution of the earthquake describes the pattern of relative motion between the faulted-blocks under static conditions, while describing the migration of the earthquakes under a dynamic state.

In view of the concentration of tectonic stressfield and its variation, the regularity of earthquake migration and its dynamic state were discussed in connection with the characteristic features of seismic activities in China. By some simple model experiments earthquake migration may be compared with the development of the relevant fractures.



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TITLE: "Balipholite and Its Crystal Structure"

SOURCE: Peking TI-CHIH K'O-HSUEH [SCIENTIA GEOLOGICA SINICA] in Chinese No 1, Jan 77 pp 65-82

TEXT OF ENGLISH ABSTRACT: Balipholite is a species of barium- and lithium-bearing silicate mineral occurring in zinnwaldite quartz vein geode. It is white with silky luster, and forms acicular, fibrous, radiating or parallel sheaf-like aggregates, the fiber being up to 1 cm long.

This mineral includes two varieties of different composition:  $\text{BaMg}_2\text{LiAl}_3(\text{Si}_2\text{O}_6)_2(\text{OH}, \text{F})_8$  and  $\text{BaMgLi}_{1.5}\text{Al}_{3.5}(\text{Si}_2\text{O}_6)_2(\text{OH}, \text{F})_8$ . It belongs to the orthorhombic system, with a space group  $Ccca$ , in which  $a=13.60\text{\AA}$ ,  $b=20.24\text{\AA}$ ,  $c=5.16\text{\AA}$ . The strongest diffraction line of the powdered patterns:  $10.12\text{\AA}$  (100),  $4.05\text{\AA}$  (78),  $3.39\text{\AA}$  (91),  $2.605\text{\AA}$  (31),  $3.390\text{\AA}$  (28). It is characterized by perfect cleavage parallel to {010} and distinct cleavages parallel to {100} and {110}, colorless under the microscope.  $N_g = 1.5984$  (a-axis),  $N_m = 1.5954$  (c-axis, parallel to the fiber),  $N_p = 1.5807$  (b-axis). Specific gravity = 3.32-3.33.

[continuation of TI-CHIH K'O-HSUEH No 1, Jan 77 pp 65-82]

Its infrared absorption spectrum is similar to that of carpholite group and orthorhombic pyroxenes. The difference of OH stretching frequency and intensity between the two varieties is caused by the type and the amount of the cation connected with the OH ion in the structure.

A big endothermic effect appears near  $700^\circ\text{C}$  on the differential thermal curves, and small ones are at  $870^\circ$ ,  $900^\circ$ ,  $985^\circ$  and  $1030^\circ\text{C}$ . A sharp fall in weight appears at  $600^\circ$ - $700^\circ\text{C}$  on the dehydration curves.

The samples heated at different temperatures ( $500^\circ$ - $1000^\circ\text{C}$ ) have been subjected to quantitative analysis on  $\text{H}_2\text{O}$  and F, X-ray analysis by diffractometer on powdered samples and infrared study, from which it is ascertained that thermal changes have brought about the appearance of different minerals, namely tainolite (K, Ba)  $\text{LiMg}_2\text{Si}_4\text{O}_{10}\text{F}_2$ , beta-spodumene ( $\beta\text{-LiAlSi}_2\text{O}_6$ ), and cymrite ( $\text{BaAl}_2\text{Si}_2\text{O}_8\text{H}_2\text{O}$ ) at  $620^\circ\text{C}$ , hexagonal celsian ( $\text{BaAl}_2\text{Si}_2\text{O}_8$ ) at  $900^\circ\text{C}$  and monoclinic celsian ( $\text{BaAl}_2\text{Si}_2\text{O}_8$ ) at  $1600^\circ\text{C}$ . The differential thermal curves have been satisfactorily explained. Diffraction points  $hk0$ ,  $0kl$  have been collected with weissenbergs equi-inclination multi-film technique. The crystal structure has been analyzed and the various atomic coordinates have been determined.  $R(0kl)$  is 11.12%, and  $R(hk0)$  is 9.76%.

[continuation of TI-CHIH K'O-HSUEH No 1, Jan 77 pp 65-82]

Determination of the crystal structure indicates that balipholite has a similar structure as that of the carpholite group, that is, having single chains of pyroxene  $(\text{SiO}_2\text{O}_6)_{10}^{4-}$ . Such a mineral from the angle of the crystallochemistry for silicate is characterized by having both double chains and sheet-like structure, from which the various aspects such as the crystal habit, the cleavage and the optical characters can be properly explained.

AUTHOR: SHEN Pu-ming [3088 2975 2494]  
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ORG: None

TITLE: "An Experimental Study of Ferro-Cordierite Synthesis by Quenched Power-Station Slag"

SOURCE: Peking TI-CHIH K'O-HSUEH [SCIENTIA GEOLOGICA SINICA] in Chinese No 1, Jan 77 pp 83-92

TEXT OF ENGLISH ABSTRACT: The ferro-cordierite is easily synthesized by quenched power-station slag in the range 800-1140°C. Experimental samples were crystallized under the reduction condition provided by the carbon powder. In the experimental study on the system of  $\text{FeO-Al}_2\text{O}_3\text{-SiO}_2$ , a new polymorphous phase of ferro-cordierite was obtained. This phase is a solid solution with high temperature quartz-type structure being analogous to that of Mg-cordierite. The synthesized ferro-cordierite has lattice dimension of  $a_0=5.196\text{\AA}$ ,  $c_0=5.364\text{\AA}$ , and refractive index  $n=1.578-1.583$ . It began to crystallize at 700°C and transformed to ferro-cordierite at 850°C. The lattice dimension of the ferro-cordierites synthesized at 850°, 900°, 1000°, 1070° and 1140°C were measured by means of X-ray powder diffractometry. All the distortion indices of the ferro-cordierites are equal to zero, and its measurements clearly show very low coefficient of expansion.

AUTHOR: None

ORG: The Computing Group and Mineral-Physical Group, Institute of Geology, Academia Sinica; Group of Nuclear Technology Application, Institute of High Energy Physics, Academia Sinica

TITLE: "A Study of Natural Pyropes By Mossbauer Effect"

SOURCE: Peking TI-CHIH K'O-HSUEH [SCIENTIA GEOLOGICA SINICA] in Chinese No 1, Jan 77 pp 93-103

TEXT OF ENGLISH ABSTRACT: Seven samples of natural pyrope from different type rocks were analyzed by Mossbauer spectroscopy. The available spectra were fitted by computer to Lorentzian line shapes. It is found that the single peak area and intensity of the ferrous iron doublet are asymmetrical, and it is possible to distinguish the pyropes of kimberlite type from other types by asymmetrical parameters.

8650

CSO: 4009

ACTA GEOPHYSICA SINICA

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ORG: Institute of Geophysics, Academia Sinica

TITLE: "Relation Between the Seismic Source Mechanism and the Intensity Distribution" (continued)

SOURCE: Peking TI-CH'IU WU-LI HSUEH-PAO [ACTA GEOPHYSICA SINICA] in Chinese Vol 20, No 1, Jan 77 pp 9-19

TEXT OF ENGLISH ABSTRACT: Besides the relatively obvious influence on the distribution of seismic intensity of the depth of focus and of the attenuation factor of the crustal medium, the mode of rupture at the focus (unilateral or bilateral), the velocity and direction of rupture, length of the dislocating fault surface, its dip angle and the form of dislocation are also related to seismic intensity distribution. Particularly, the rupture velocity and rupture direction would have more effect. When the rupture has a greater velocity and upward in direction, the epicentral intensity of an earthquake may be raised by one degree or more and the most destructive area increased one to two times. If the converse is the case, the epicentral intensity can be reduced by one degree or so while the most destructive area may be greatly diminished in size.

[continuation of TI-CH'IU WU-LI HSUEH-PAO] No 1, Jan 77 pp 9-19]

Based on the analysis of the relation between the distribution of seismic intensity and the seismic source parameters, we can determine the source parameters from the isoseismals of historical earthquakes. For trial, the data of three historical earthquakes occurring in China have been used to get their source parameters.

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TITLE: "Preliminary Study of the Microseisms in Relation to Earthquakes"

SOURCE: Peking TI-CH'IU WU-LI HSUEH-PAO [ACTA GEOPHYSICA SINICA] in Chinese  
Vol 20, No 1, Jan 77 pp 20-32

TEXT OF ENGLISH ABSTRACT: In order to seek the earthquake precursors, the characteristic variations of microseisms preceding several larger earthquake occurrences are analyzed in brief. It is found that amplitude of microseism decreased abnormally at a station near the epicenter ( $\Delta \approx 20$  km) a few days before the occurrence of the Hai-ch'eng earthquake ( $M=7.3$ ) on 4 February 1975. Preliminary analysis shows also that the phenomena such as the variation of the direction of approach of microseisms and the correlation between different components of the microseisms before large earthquakes are worthy of note.

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ORG: None

TITLE: "Multifrequency Synthetic Detecting Holography"\*

SOURCE: Peking TI-CH'IU WU-LI HSUEH-PAO [ACTA GEOPHYSICA SINICA] in Chinese  
Vol 20, No 1, Jan 77 pp 33-58

TEXT OF ENGLISH ABSTRACT: The paper includes two parts. The first part is a theoretical part, in which the characteristics of holography as applied to detection is discussed, and the notion of "detecting holography" is proposed. The principal difficulty encountered in applying elastic or electromagnetic waves to the earth media is the poor longitudinal resolution of monochromatic holography. From the viewpoint of the communication theory and the antenna array theory, the monochromatic holography is examined, and its relations to correlation detection, matched filters as well as phased array antennas are illustrated. Multifrequency synthetic detective holography is developed as a possible approach to the solution of the longitudinal resolution problem.

\*Present article received 1 Feb 1975.

[continuation of TI-CH'IU WU-LI HSUEH-PAO No 1, Jan 77 pp 33-58]

Its principles are discussed, its relations to the "impulse holography" and the formulas for the longitudinal resolution are deduced. Finally, examples of two-dimensional computer simulation are presented to illustrate the feasibility of the method.

The second part is an account of experiments made in a water tank for the microwave multifrequency synthetic detecting holography. The results of computer reconstruction using interference-type holograms give evidence to prove the high resolution and good imaging quality of the method.

AUTHOR: LIU Yuan-lung [0491 0337 7893]  
WANG Ch'ien-shen [3769 6197 6500]

ORG: Institute of Geophysics, Academia Sinica

TITLE: "Inversion of Gravity Data By Use of a Method of 'Compressed Mass Plane' to Estimate Crustal Structure"\*

SOURCE: Peking TI-CH'IU WU-LI HSUEH-PAO [ACTA GEOPHYSICA SINICA] in Chinese  
Vol 20, No 1, Jan 77 pp 59-69

TEXT OF ENGLISH ABSTRACT: This paper presents a method called the "Compressed Mass Plane" to approximate a two-dimensional geological body. At first, the data of a gravity data is inversed, using matrix analysis to get the surface density of each element of the compressed mass plane. Then, from the relation between surface density and mass density of each element, the thickness of each two-dimensional element can be calculated and the approximate thickness of the crust tentatively obtained. Further improvements of the estimation of the crustal thickness can be made by direct gravity computation of the crustal model thus obtained and repeated adjustments of the results in order to

\*Present article received Nov 1975.

[continuation of TI-CH'IU WU-LI HSUEH-PAO No 1, Jan 77 pp 59-69]

minimize the difference between computed and observed gravity anomalies. In that way, it may be possible to get the better depths of the lower boundary of the crust.

Based on the assumed values of contrast between the "Basaltic," the "Granitic" layers and the Upper Mantle and also the above-calculated crustal thickness, it is again possible to calculate the gravity anomalies coming from the undulations of the Mohorovicic and Conrad interfaces respectively. By the same way, the inversion of the gravity anomaly of the Conrad interface, a comparatively correct position of this interface can be obtained.

To test this method of gravity inversion, three hypothetic crustal models and an observed gravity profile are introduced here as examples. In comparing with other methods of determining crustal interfaces, the results of the present method of compressed mass plane seem to be better.

AUTHOR: None

ORG: The 2d Group, 10th Research Division, Institute of Geophysics, Academia Sinica

TITLE: "On the Seismo-Magnetic Induction Effect (I)--A Numerical Theory of Three-Dimensional Electromagnetic Induction"

SOURCE: Peking TI-CH'IU WU-LI HSUEH-PAO [ACTA GEOPHYSICA SINICA] in Chinese Vol 20, No 1, Jan 77 pp 70-80

TEXT OF ENGLISH ABSTRACT: This work consists of two parts. The first part is a study of the numerical theory of the three-dimensional electromagnetic induction problem. The second part is the results of computations of the seismomagnetic induction effect. This paper deals with the first part. It gives the methods of solving by finite differences the general equations of the three-dimensional electromagnetic induction deduced from Maxwell's Equations together with the boundary conditions. A complete numerical theory of three-dimensional electromagnetic induction has been established. The results of computations, the second part, will be given in a subsequent paper.

AUTHOR: HUANG Hung-tse [7806 3163 3419]

ORG: None

TITLE: "The Mechanism of Diffracted Waves"

SOURCE: Peking TI-CH'IU WU-LI HSUEH-PAO [ACTA GEOPHYSICA SINICA] in Chinese  
Vol 20, No 1, Jan 77 pp 81-88

TEXT OF ENGLISH ABSTRACT: This paper deals with the results of a three-dimensional ultrasonic wave model experiment designed to study the mechanism of refractive diffracted waves. It has been shown that in the three-dimensional space, diffractions observed at any surface point consist of wavelets diffracted from an infinite number of diffraction sources, which are distributed along the wedge of diffraction or the fault. This point is also true in case the observation is along the direction perpendicular to the wedge or fault.

It is pointed out that the dynamic nature of diffraction varies with the geometrical nature of the wedge or fault. Therefore, on the basis of this result, we can suppose that by studying the dynamic nature of diffraction in detail, some useful indications in regard to the geometry of the wedge or fault may be obtained.

[continuation of TI-CH'IU WU-LI HSUEH-PAO Vol 20, No 1, Jan 77 pp 81-88]

In addition, according to the results of the model experiment, the path of a diffractive wavelet reaching an observation point and position of the diffracting point can be shown by the "Principle of Least Time or Path."

8650

CSO: 4009



ACTA ENTOMOLOGICA SINICA

AUTHOR: None

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Section of Entomology, Forest Pest Control Experimental Station of Kiangsi;  
Section of Pine Caterpillar Moth Pheromone, Kirin; Institute of Applied  
Chemistry, Academia Sinica

TITLE: "Preliminary Isolation of Sex Pheromone of the Pine Caterpillar Moth  
By Column Chromatography"\*

SOURCE: PEKING K'UN-CH'UNG HSUEH-PAO [ACTA ENTOMOLOGICA SINICA] in Chinese  
Vol 19, No 4, Nov 76 pp 377-382

TEXT OF ENGLISH ABSTRACT: Low temperature precipitation from acetone solution was used to remove the extraneous inactive material from the crude extract of female abdominal tips of the pine caterpillar moth. After removal of the inactive precipitate, the active oil was chromatographed separately through Sephadex LH-20 and silica gel columns. The active fractions were identified by both EAG technique and field test, and resolved by thin layer chromatography. Experimental results show that the sex pheromone system of the pine caterpillar moth seems to have at least two components, one of which being more polar and the other less polar. The former probably has an alcohol functionality, for

[continuation of K'UN-CH'UNG HSUEH-PAO No 4, Nov 76 pp 377-382]

the saponified crude extract has been proved to be active in EAG responses as well as in field tests.

\*During this work support was obtained from the forestry bureaus of Yi-yang, Le-p'ing, Wan-nien and Yu-chiang counties in Kiangsi, the agricultural bureau of Chia-shan county and the Sha-chuang, Hsi-t'ao-yuan forests in Anhwei, and the Chang-mu-t'ou forest of Tung-kwan county in Kwangtung.

AUTHOR: None

ORG: The Worker-Peasant-Soldier Students Class 1972, Teaching and Research Group of Agricultural Entomology, Fukien College of Agriculture

TITLE: "Further Studies on the Paddy Thrips in Fukien Province"

SOURCE: Peking K'UN-CH'UNG HSUEH-PAO [ACTA ENTOMOLOGICA SINICA] in Chinese Vol 19, No 4, Nov 76 pp 393-400

TEXT OF ENGLISH ABSTRACT: This paper deals with the paddy thrips Thrips oryzae Williams and Haplothrips aculeatus (Fabricius). The former has become one of the most important rice insect pests in Fukien in the last few years; it infests mainly the leaves, making rice seedlings wither. It appears in early March and becomes abundant during April and May. According to our observations it has 15 generations in Fukien and the winter is passed over in the adult, larva or egg stages. The winter hosts are Leesia sp. and other weeds beside streams and ponds. The adult stage lasts 5-60 days, egg 3-13 days and larva 4-25 days, and in growing seasons it takes 10-43 days to complete one generation. Haplothrips aculeatus is less injurious to rice but usually abundant on wheat and sorghum. It injures mainly the flowers and, to a lesser degree, the leaves.

[continuation of K'UN-CH'UNG HSUEH-PAO No 4, Nov 76 pp 393-400]

Several insecticides were tested for their control in the fields. Spraying with dimethoate emulsion has been proved to be most effective. Destruction of the over-wintering host plants is considered very important to reduce the thrip populations in the rice fields.

AUTHOR: CH'ENG Liang [4453 6852]

ORG: Department of Biology, Yunnan University

TITLE: "A Preliminary Study on the Arctiid Moth Alphaea phasma (Leech)"\*

SOURCE: Peking K'UN-CH'UNG HSUEH-PAO [ACTA ENTOMOLOGICA SINICA] in Chinese  
Vol 19, No 4, Nov 76 pp 410-416

TEXT OF ENGLISH ABSTRACT: The present paper deals with the arctiid moth Alphaea phasma (Leech). The larva of this species is a polyphagous pest which causes serious damages to crops and other economic plants. In Kunming it has one generation a year and overwinters in the pupal stage. The adults emerge in May and the larvae hatch in June and mature in October. Seven instars were observed in the larval development. Its important natural enemies are the parasitic wasp Rhogas sp. and the parasitic fly Myxexoristops bicolor Villeneuve. For chemical control BHC dusting and Dipterex spraying give better results.

\*The scientific names of Alphaea phasma (Leech) and the species of parasitic fly in the present article were identified respectively by comrades FANG Ch'eng-lai [2455 2110 5490] and EHAO Chien-ming [6392 1696 6900] of the Peking Zoological Institute, Academia Sinica; Comrades CH'IEN Ch'eng-yu [6929 3397 1342] and HSU Wen-hsuan [1776 2429 1357] of this department identified the

[continuation of K'UN-CH'UNG HSUEH-PAO No 4, Nov 76 pp 410-416]

host plants; Comrade WANG Chung-fu [3769 0022 1382] (previously in this department, now transferred) took part in parts of the work from September to November of 1962.

AUTHOR: None

ORG: Hsin-hsiang Ch'i-li-ying Commune 5786 Agricultural College

TITLE: "Further Observations on the Population Fluctuations of the 'Summer Aphids' in Cotton Fields"

SOURCE: Peking K'UN-CH'UNG HSUEH-PAO [ACTA ENTOMOLOGICA SINICA] in Chinese Vol 19, No 4, Nov 76 pp 417-424

TEXT OF ENGLISH ABSTRACT: The original aphid population in the cotton field at the middle of June serves as the basis for further multiplication of the "summer aphids ("fur-aphids"), and the population size would determine the position of peak in calendrical scale but not conspicuously the duration of the occurrence. This basic population size is closely related to the population densities of its natural enemies and human efforts in aphid control in the cotton field and to a lesser degree the meteorological factors in our district.

The "summer aphids" from late June to August seem to have a rather higher adaptability to the cotton field micro-climates. Their multiplication is only checked when high temperature and high humidity occur simultaneously.

[continuation of K'UN-CH'UNG HSUEH-PAO No 4, Nov 76 pp 417-424]

Rainfalls in July and August can influence the aphid population fluctuation: their multiplication is favored by frequent alternation of fine and rainy days but checked by a rainy period longer than six days.

The fungus Entomophthora aphidis seems to be one of the major natural enemies of the cotton aphid. The date and intensity of its epidemic will greatly influence the duration of occurrence and population fluctuation of the "summer aphids." The epidemiology of this fungus is conditioned by the population density and activity of alate form of the aphids as well as by meteorological factors.

\*The present study received the help and support of the Plant Protection Office of the Honan Academy of Agricultural Sciences and comrade CH'I Chao-sheng [7871 0340 3932] of the Plant Protection Office of the Chinese Academy of Agricultural Sciences.

ACTA ENTOMOLOGICA SINICA

AUTHOR: None

ORG: Unit of Insect Microbiology, Speciality of Entomology, Department of Biology, Sun Yat-sen University\*

TITLE: "A Study on the Standardization of Bacillus thuringiensis Products By Using Newly-Hatched Silkworm Larvae as Test Insects"

SOURCE: Peking K'UN-CH'UNG HSUEH-PAO [ACTA ENTOMOLOGICA SINICA] in Chinese Vol 20, No 1, Feb 77 pp 5-13

TEXT OF ENGLISH ABSTRACT: The present work deals with the standardization of Bacillus thuringiensis products by using newly-hatched silkworm larvae (Bombyx mori) as the test insects. Comparisons have been made with different varieties of the microbe including thuringiensis, galleriae, kurstaki and dendrolimus, and also with different test insects including the rice leaf roller, Cnaphalocrosis medinalis, the cabbage worm, Pieris canidia, and the pine caterpillar, Dendrolimus punctatus. The method used was to dip the silkworm eggs about to hatch in different concentrations of the suspensions; and it was found feasible to employ a suitable formulation of galleriae as the standard to determine the potencies of various products of Bacillus thuringiensis in China.

[continuation of K'UN-CH'UNG HSUEH-PAO No 1, Feb 77 pp 5-13]

\*The present study had the support of the Kwangtung Silkworm Breeding Test Fields and the Hunan Institute of Microbiology; Comrades CHAO Ming-li [6392 2494 4409] and CHANG Wen-lan [1728 2429 5695], worker-peasant-soldier students of our '72 special entomology term, participated in some of the experiments.

AUTHOR: None

ORG: Research Group on Resistance to Insecticides, Shanghai Institute of Entomology\*

TITLE: "Studies on the Resistance to  $\gamma$ BHC, Parathion and Sumithion in Paddy Borer (Tryporyza incertulas Walker)"

SOURCE: Peking K'UN-CH'UNG HSUEH-PAO [ACTA ENTOMOLOGICA SINICA] in Chinese Vol 20, No 1, Feb 77 pp 14-20]

TEXT OF ENGLISH ABSTRACT: Resistance to  $\gamma$ BHC, Parathion and Sumithion was tested in paddy borer, Tryporyza incertulas Walker, by using the following two methods in 1969-70: (I) The newly-hatched larvae were exposed to insecticide-impregnated rice seedlings and the mortality was checked after 24 hours. (II) The newly-hatched larvae were exposed to the mixture of the breeding medium and insecticides for 48 hours.

Preliminary results indicated that the paddy borers from Chin-shan county of Shanghai were found to have resistance to  $\gamma$ BHC and Parathion. The resistance of the paddy borers collected from Chin-shan to  $\gamma$ BHC and Parathion was 7.2 and 3.1 times respectively in comparison with those from Ch'ung-ming island of Shanghai.

[continuation of K'UN-CH'UNG HSUEH-PAO No 1, Feb 77 pp 14-20]

The data obtained showed that the Parathion-resistant paddy borer from Chin-shan was resistant to Sumithion too, which had not been used in the fields before.

\*This work had the help and support of the Kwangsi Liu-chiang Agricultural Technology Station, the plant protection department of the Kwangsi Academy of Agricultural Sciences, the Kwangsi Chan-chiang Office of Agricultural Sciences, the Shan-yang commune survey-reporting station in Chin-shan county, Shanghai, the Sung-chiang county survey-reporting station, the Ling-ch'iao commune survey-reporting station in Ch'uan-sha county, and the Ch'ung-ming county survey-reporting station.

AUTHOR: None

ORG: Insect Metabolism Section, Division of Insect Physiology, Peking Institute of Zoology, Academia Sinica

TITLE: "Experiments on the Toxicities of Antibiotics Towards Some Pest Insects"

SOURCE: Peking K'UN-CH'UNG HSUEH-PAO [ACTA ENTOMOLOGICA SINICA] in Chinese Vol 20, No 1, Feb 77 pp 21-32

TEXT OF ENGLISH ABSTRACT: In the present work about 40 antibiotics were tested for their toxicities on the larvae of the great wax moth, Galleria mellonella, the armyworm, Leucania separata, the cotton bollworm, Heliothis armigera, and the green peach aphid, Myzus persicae. It was found that the antibiotics are rather specific in their mortality effects towards different insect species. When mixed in an artificial diet actinomycin D, qingfengmycin, blasticidin 5, terramycin and kasugamycin caused relatively high mortality rates on Galleria mellonella. But for the armyworm and the cotton bollworm only blasticidin S was effective when the solution was applied to the corn and cotton leaves respectively, and for Myzus persicae qingfengmycin was better than blasticidin S. The factor causing mortality in different insect species has been tested and discussed.

AUTHOR: None

ORG: Spider Mites Research Group, Hopeh Institute of Pomology

TITLE: "An Examination on the Resistance of Tetranychus viennensis Zacher to Organophosphoric Insecticides"

SOURCE: Peking K'UN-CH'UNG HSUEH-PAO [ACTA ENTOMOLOGICA SINICA] in Chinese Vol 20, No 1, Feb 77 pp 33-38

TEXT OF ENGLISH ABSTRACT: It was found that the hawthorn spider mite Tetranychus viennensis Zacher in many old fruit orchards of Hopeh province was resistant to Parathion and Systox, and also showed resistance in different degrees to some other insecticides such as DDVP, OMPA, 1240, Trithion, Roger, Methylparathion, Malathion, Sumithion, etc. For practical controlling the resistant strains Akar-338, lime-sulfur solution, Chlorophenamidine and Kelthane are still effective. Some methods to prevent or to delay the development of resistance in this spider mite are suggested.

AUTHOR: T'U Yu-ch'in [1458 0056 2953]

ORG: None

TITLE: "The Relations of Foliage Osmotic Potential and Environmental Factors to the Systemic Insecticidal Action of Systox"

SOURCE: Peking K'UN-CH'UNG HSUEH-PAO [ACTA ENTOMOLOGICA SINICA] in Chinese Vol 20, No 1, Feb 77 pp 39-48

TEXT OF ENGLISH ABSTRACT: According to the author's experience in the control of cotton aphids, the systemic insecticidal action of Systox was different when it was applied at different times of the day. It was best towards the evening (5:00 to 7:00 p.m.), good in the morning (6:00 to 10:00 a.m.), and worst around noon (10:00 a.m. to 3:00 p.m.). Determinations of the foliage osmotic potentials of cotton, wheat and apple revealed their correlation to the systemic insecticidal action of Systox. The latter was also influenced by temperature, relative humidity, soil water content and light intensity in the field; but the foliage osmotic potential was the most important and direct factor. At noon the higher temperature, stronger solar radiation and lower relative humidity made the insecticide evaporate more readily than towards the evening and in the morning, and this situation may be accounted as one of the factors lessening the systemic action of the insecticide.

AUTHOR: K'UANG Ping-ch'ien [6782 3521 0051]\*

ORG: Crop Insect Pest and Disease Prognosis Station, Huan-chiang County, Kwangsi Autonomous Region [Kwangsi Ho-ch'ih Regional Agricultural School]

TITLE: "Studies on Two Long-Horned Beetles Infesting Coffee Trees in Kwangsi Autonomous Region"

SOURCE: Peking K'UN-CH'UNG HSUEH-PAO [ACTA ENTOMOLOGICA SINICA] in Chinese Vol 20, No 1, Feb 77 pp 49-56

TEXT OF ENGLISH ABSTRACT: This paper deals with the bionomics and control measures of two long-horned beetles infesting coffee trees in western Kwangsi Autonomous Region. Xylotrechus qudrupes Chevrolat is more common than X. grayii White. The former mostly breeds two generations a year and the larvae and pupae pass over the winter. Aside from coffee trees (Coffea arabica) it also prefers Wendlandia myriatha, Randia spinosa, etc., as host plants. X. grayii

\*The present work was carried out under the direction of comrade HU Shao-po [5170 1421 3134] of the Kwangsi Agricultural College, comrades LI Chien-sheng [2621 0494 3932] of the Pai-se Regional Agricultural Bureau, HUANG Hsiu-hsing [7806 4423 5281] of the Institute of Sub-tropical Crops, and HUANG Kuan-hua [7806 0385 5478] of the Yang-fu farmlands.



[continuation of K'UN-CH'UNG HSUEH-PAO Vol 20, No 1, Feb 77 pp 49-56]

has one generation a year and the adults pass over the winter. Its host plant range is broader than that of X. gudripes. The control measures include to eliminate the heavily infested coffee trees and other host plants in the coffee groves and to treat the infested trees with insecticides.

AUTHOR: CH'IU Ming-hua [5491 2494 5478]

ORG: Department of Parasitology, Chungking Medical College

TITLE: "The Gonotrophic Cycle of the Blood-Sucking Midge, Culicoides riethi Kieffer, and the Influence of Its Parasites"

SOURCE: Peking K'UN-CH'UNG HSUEH-PAO [ACTA ENTOMOLOGICA SINICA] in Chinese Vol 20, No 1, Feb 77 pp 57-67

TEXT OF ENGLISH ABSTRACT: An investigation on the relation between blood digestion and ovarian development and the influence of its parasites on the reproduction in the blood-sucking midge Culicoides riethi Kieffer in Chungking was carried out during 1960 to 1962. Fat reserves were not found in females in winter months, and blood feeding and oviposition were continuous except in a short period from January to February. Except in January there are at least two recurrences of the gonotrophic cycle in every month. Out of 5,112 adult females dissected monthly from July, 1960 to June, 1961, 5,015 (98.06%) showed the existence of gonotrophic harmony and 63 (1.23%) showed disharmony. However, gonotrophic dissociation was also noticed in 36 females (0.70%). The phenomena of gonotrophic disharmony and dissociation appeared almost in every month.

[continuation of K'UN-CH'UNG HSUEH-PAO No 1, 1977 pp 57-67]

There were three species of parasites of Culicoides riethi in Chungking: an ectoparasitic mite, an endoparasitic ciliate (Blantidium sp.) and an entomophilic nematode belonging to Mermithidae. Female midges in different developmental stages and physiological conditions were observed to harbor the mermithid nematodes which caused ovarian degeneration and sterilization of the females. In the sterilized female midges the nematodes may differ in number, sex and developmental stages.

AUTHOR: None

ORG: Division of Biophysics, T'ieh-lin Agricultural College, Liaoning Province

TITLE: "Preliminary Report of Raising Cocoon Production in the Oak Silkworm By Irradiation With  $^{137}\text{Cs}\gamma$ -Ray"

SOURCE: Peking K'UN-CH'UNG HSUEH-PAO [ACTA ENTOMOLOGICA SINICA] in Chinese Vol 20, No 1, Feb 77 pp 119-120

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CSO: 4009

ACTA ZOOLOGICA SINICA

AUTHOR: None

ORG: Shanghai Institute of Parasitic Diseases, Shanghai

TITLE: "The Great Proletarian Cultural Revolution Gives a Great Impetus to the Development of Scientific Research for Preventing and Curing Schistosomiasis"

SOURCE: Peking TUNG-WU HSUEH-PAO [ACTA ZOOLOGICA SINICA] in Chinese Vol 22, No 4, Dec 76 pp 305-307

TEXT OF ENGLISH ABSTRACT: The ten years since the beginning of the Great Proletarian Cultural Revolution are years of victories and successes in socialist revolution and construction. Also they are the ten years during which the mass movement of antischistosomiasis campaign has developed vigorously and the scientific research of preventing and curing schistosomiasis has made great achievements. Since the Great Proletarian Cultural Revolution, the number of patients that have been cured from schistosomiasis and the extent of areas that have been ridden of the oncomelaniid snails exceed respectively the total recorded for 17 years before the cultural revolution. Following Yu-chiang county and 38 other counties, more than 100 counties have practically wiped out schistosomiasis.

AUTHOR: T'UNG Ti-chou [4547 4574 0719]  
YEH Yu-fen [5509 3022 5358]  
SHIH Ying-hsien [0670 3467 0103]  
CHANG Yu-lien [1728 3768 1670]  
CHENG Jui-chen [6774 3843 3791]  
WANG Su-min [3769 4790 2404]  
YU Chien-k'ang [0060 1696 1660]  
HSUEH Kuo-hsiung [5641 0948 7160]

ORG: Peking Institute of Zoology, Academia Sinica

TITLE: "Immunization of Rats By Tumor Hybrid Cells"\*

SOURCE: Peking TUNG-WU HSUEH-PAO [ACTA ZOOLOGICA SINICA] in Chinese Vol 22 No 4, Dec 76 pp 308-313

TEXT OF ENGLISH ABSTRACT: The present study is a follow-up of our previous work which was given at the meeting of the Cancer Society of Peking in 1972.

\*The cell cultures for the current experiment were done by comrades LI Yu-lan [2621 1635 5695], CHAO Chi-ying [6392 1323 5391] and SHEN Shou-k'un [3088 1108 2492]; the photographs were taken by comrade HUANG Kuo-p'ing [7806 0948 1456].

[continuation of TUNG-WU HSUEH-PAO No 4, Dec 76 pp 308-313]

Hybrid cells formed by UV-inactivated Sendai virus-induced fusion of Walker-256 carcinoma cells and cock erythrocytes were used to immunize against Wistar rats' Walker carcinoma. Using fluorescent microscopy, the surface antigens of both parents were found over the entire hybrid cells.

Of 68 immunized rats, 10 (14.7%) produced tumors and died between 18-60 days (average 30.5 days). Thus, 58 (85.3%) survived. Some of them bore no tumors, while others produced tumors but finally regressed.

All 68 control rats developed tumors. Fifty-five (80.9%) of them died between 12-50 days (average 23.7 days) and 13 (19.1%) survived.

It was discussed that the function of tumor hybrid cells is possibly to stimulate the host immune system and that the tumor hybrids may be used as an immuno-therapeutic agent to destroy the residual tumor cells after surgery or other treatments.

AUTHOR: None

ORG: Institute for Cancer Research, Chinese Academy of Medical Sciences;  
Cancer Hospital of Hupeh Province

TITLE: "Epidemiology and Pathology of Paryngo-Esophageal Cancers in Domestic Fowls from Honan Migrant Communities and Native Inhabitants in Chung-hsiang County, Hupeh Province"

SOURCE: Peking TUNG-WU HSUEH-PAO [ACTA ZOOLOGICA SINICA] in Chinese Vol 22, No 4, Dec 76 pp 314-318

TEXT OF ENGLISH ABSTRACT: According to a recent survey on the mortality rate of esophageal cancers in Chung-hsiang county, Hupeh province, it is known that the communities of migrants from Honan province have a high risk of the cancer (82.81/100,000), but that a rather low mortality rate is noted among the native inhabitants (21.53/100,000) of the same county. Thus there is a marked difference in the ratio frequency of cancer risk between the two groups of people. An investigation on the comparative epidemiology and pathology of pharyngoesophageal cancers in the domestic fowl population of age over 2 years old was then carried out in Chung-hsiang county. The results showed that among the 5,484 poultry of migrant communities, 12 cases of pharyngeal and pharyngoesophageal cancers

[continuation of TUNG-WU HSUEH-PAO No 4, Dec 76 pp 314-318]

found, with a prevalence rate of 220/100,000, although none of the 2,371 poultry belonging to the native inhabitants had the same cancer. All of the 12 cases of cancer occurred in hens ranging from 2 to 8 years old (Table 1). The size of the tumor was 1-2 cm in diameter (figs. 2-3). Microscopically, all the tumors were squamous cell carcinoma (figs. 4-5). In nine cases cancer cells had infiltrated into the muscular layers of the pharyngoesophageal wall. Only 1 of the 12 cases of cancer may be classified as the early squamous cell carcinoma. In 5 out of the 12 cases of diseased fowls, the owners and their neighbors had also suffered from esophageal cancer.

Results of the present study indicated that there is a connection between esophageal cancers in human beings and those in domestic chickens. It is presumed that there are carcinogenic factors common to both humans and domestic fowls. Perhaps they are operated through certain special living habits of the high risk people.

AUTHOR: None

ORG: Institute for Cancer Research, Chinese Academy of Medical Sciences, Peking

TITLE: "Epidemiology and Pathological Morphology of Pharyngeal and Esophageal Cancer in Domestic Fowls"

SOURCE: Peking TUNG-WU HSUEH-PAO [ACTA ZOOLOGICA SINICA] in Chinese Vol 22, No 4, Dec 76 pp 319-326

TEXT OF ENGLISH ABSTRACT: A survey on the prevalence rate of pharyngeal and esophageal carcinomas in the domestic fowl population of age over 6 months was carried out in Lin-hsien county (Honan), an area with a high mortality rate of esophageal cancers among human beings, and in Fan-hsien (Honan) and Hun-yuan (Shansi) counties with low esophageal cancer mortality rates. Among the 18,774 poultry of Lin-hsien county, 33 cases of histologically proved gullet cancers were found (175.78/100,000), and only 2 cases each were found in both Fan-hsien county and Hun-yuan county where 11,399 (17.55/100,000) and 9,420 (21.23/100,000) poultry were examined respectively (Table 1). The present results give further evidence that there is a corresponding rate in the prevalence of human and poultry cancers.

[continuation of TUNG-WU HSUEH-PAO No 4, Dec 76 pp 319-326]

In Lin-hsien, Fan-hsien and Hun-yuan counties a group of 152 cases of pharyngeal and esophageal cancer in the domestic fowls was collected. The age distribution was 29.60% for poultry of 2-4 years old, 50% for those of 5-6 years old, 16.44% for those of 7-9 years old and only a few for those of age under 2 years or above 9 years (Table 3). 54.54% of the diseased poultry belonged either to the owners or to neighbors suffering from esophageal cancers (Table 2). The main site of localization of the cancer was at the level of the pharynx, 89 cases (58.55%), while 41 cases (26.97%) were localized at the junction of the pharyngeal and esophageal openings; at the upper end of the esophagus there were 22 cases (14.47%) (Table 4). The sizes of the tumor varied from 1 to 3 cm in diameter (67.1% of cases), the largest being 5.3 cm in diameter (Table 5). Gross observation showed that the 152 cases of cancer may be classified into cauliflower type (42.76%), nodular type (23.02%), infiltrative type (20.39%), ulcerative type (9.21%) and undetermined (4.61%) (Table 6). Microscopically, there were 145 cases (96.6%) of squamous cell carcinoma and 7 cases of adenocarcinoma and adenoacanthoma (figs. 1-8). Most of the tumors showed a medium degree in cell differentiation (Grade II-III, 63.1%). In 3 cases, pulmonary metastases were found. In the 152 specimens examined, most of them presented various degrees of epithelial hyperplasia of the esophagus, especially in areas in proximity to the growth (figs. 9-10). In 23 cases, there were multiple primary tumors and in 19 of these were primary lesions in both the pharynx and the esophagus.

AUTHOR: None

ORG: Institute for Cancer Research, Chinese Academy of Medical Sciences, Peking

TITLE: "Esophageal Carcinoma in a Goat From Lin-hsien, Honan Province"

SOURCE: Peking TUNG-WU HSUEH-PAO [ACTA ZOOLOGICA SINICA] in Chinese Vol 22, No 4, Dec 76 pp 327-328

TEXT OF ENGLISH ABSTRACT: A carcinoma of the esophagus developed in a male goat, about 7 1/2 years old, in Lin-hsien county, an area where esophageal cancer in man is prevalent. Progressive dysphagia was noted for five months before the death of the goat.

Macroscopic observation: A cauliflower type tumor, measuring 12.5 x 10 x 2.5 cm, was observed in the midportion of the esophagus, and it protruded into the lumen (plate I, fig. 1). In the center of the tumor there was a deep ulceration. Cut surface of the specimen was grayish white in color, with coarse granulation in appearance, and the lesion perforated the esophageal wall. Microscopically, the tumor was a less differentiated squamous cell carcinoma. Most of the cancer cells were polygonal in shape which were arranged in patches of diffuse masses separated by fibrous tissues. Some cancer cells showed anaplastic

[continuation of TUNG-WU HSUEH-PAO No 4, Dec 76 pp 327-328]

changes and many mitotic figures were also encountered in the histological sections (plate I, figs. 2-3).

The present finding gives further evidence for the assumption that cancer of the esophagus may be related to certain environmental factors.

AUTHOR: WANG P'ei-ch'ao [3769 1014 3390]  
CH'IEN Kuo-chen [6929 0948 2823]  
LU Hou-chi [7120 0624 1015]  
SHENG Ho-lin [4141 0735 2651]

ORG: Department of Biology, Shanghai Normal University

TITLE: "The Relationship Between Scent Secretion Rhythm and Scent Productivity in the Indian Civets"

SOURCE: Peking TUNG-WU HSUEH-PAO [ACTA ZOOLOGICA SINICA] in Chinese Vol 22, No 4, Dec 76 pp 336-340

TEXT OF ENGLISH ABSTRACT: The study is based mainly on our daily observations on the activity of civets (Vierriacus indicus Desmarest), which was registered by autokinograph. In this paper results of our observations on scent-producing rhythm and the seasonal fluctuations of scent quantity of civets raised in captivity are presented.

The rhythm of the civet's scent-producing activity is associated not only with the changes in the daily photoperiod but also with the nocturnal habits of civets. The peak of scent-production generally occurs during the night,

[continuation of TUNG-WU HSUEH-PAO No 4, Dec 76 pp 336-340]

especially before midnight. However, some civets raised in captivity will, after a period of time, deposit musky sebum in the daytime also. Thus there exists a possibility of increasing scent production by training the animals to be active both in daytime and at night.

Civets usually deposit sebum several times a day. A better method to collect scent is to train the animal to deposit sebum on a board placed in a customary place.

If the constant quality of the food supply as an influential factor is excluded, the fluctuation of scent quantity is found to be controlled or influenced by the seasonal fluctuation of the environmental temperature and the day-length. When the temperature rises and the daylight lengthens, scent secretion decreases; when the daylight becomes shorter and the temperature becomes lower, it increases.

Thus, by shortening daylight and maintaining the animal at a relatively low temperature, and at the same time training them to be diurnal as well as nocturnal, it may result in an increase in their scent production.

AUTHOR: K'O Hsiao-lin [2688 3843 7792]

ORG: Department of Parasitology, Chung-shan Medical College, Canton

TITLE: "Studies on Microphallid Trematodes From China. 1. Genus Maritrema, Including Descriptions of Four New Speices"\*

SOURCE: Peking TUNG-WU HSUEH-PAO [ACTA ZOOLOGICA SINICA] in Chinese Vol 22, No 4, Dec 76 pp 361-370

TEXT OF ENGLISH ABSTRACT: Eight species of microphallid trematodes belonging to the genus Maritrema are reported in this paper. Of these, four are new to science and four are new records for this country.

\*Sincere thanks is given to comrade CHOU Yu-yuan [0719 1342 0997] of Chung-shan College for identifying the bird specimens, and to the Chan-chiang Medical School and comrade LIU Ming-t'ao [0491 6900 7290] for aiding in the collection.

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CSO: 4009



ACTA GENETICA SINICA

AUTHOR: LI Chen-kang [2621 2182 0474]

ORG: The 5-7 University of Wu-yuan, Inner Mongolia

TITLE: "A Discussion on the Regulation Activity of Chromosome in Genetic Development"

SOURCE: Peking I-CH'UAN HSUEH-PAO [ACTA GENETICA SINICA] in Chinese Vol 3, No 4, Dec 76 pp 262-270

TEXT OF ENGLISH ABSTRACT: On analyzing the biological data of the recent years, a hypothesis of chromosomal sectional activity has been produced which manifested as:

- (1) During the individual development, the chromosome proceeds in its sectional activity regularly with its different components.
- (2) The sectional activity is uninverseable and the specificity is proved gradually in the individual development. The activator of the activity is found to be the hormone and the suppressor histone.
- (3) Chromosome is a sort of essential genetic material, but far from the doctrine of Mendel-Morgan's chromatophore of gene. This was confirmed by the sectional activity of chromosomal component that was not in accordance with

[continuation of I-CH'UAN HSUEH-PAO No 4, Dec 76 pp 262-270]

the proceedings of the character differentiation. The activity of the chromosome has provided with different material basis and the processes for the character differentiation.

Lastly, by applying the hypothesis, it is hoped to render some new explanations to the principles of Mendelian genetics, the matrilineal inheritance, the corresponding stage inheritance as well as in the cases concerning cancers.

AUTHOR: None

ORG: 302 Research Group, Institute of Genetics, Academia Sinica

TITLE: "Genetic Studies on Pollen Plants in Rice (Oryza Sativa L.)"

SOURCE: Peking I-CH'UAN HSUEH-PAO [ACTA GENETICA SINICA] in Chinese Vol 3, No 4, Dec 76 pp 277-285

TEXT OF ENGLISH ABSTRACT: The ploidy of about a thousand pollen plants of rice that were obtained from anther culture in vitro were studied and the homozygosity and the hereditary rule of a part of those plants derived from hybrid F<sub>1</sub> were investigated. Sixty percent of the studied pollen plants were diploids, and set seeds normally. Ninety percent of pollen plants of those derived from hybrid F<sub>1</sub> produced uniform offspring without any segregation, i.e., the progenies of those pollen plants were genetically homozygous. Segregation either on characters or fertility or on both of them occurred in progenies of the remaining 10% of the studied pollen plants, but appeared rather simple and obviously distinct from those in F<sub>2</sub>. The recombination and segregation for four characters in 49 pollen plants obtained from hybrid F<sub>1</sub> of the same cross were studied in comparison with F<sub>2</sub> plants of the same cross combination. Both of them showed fundamentally similar results. The experimental results denoted that the frequency of producing pollen plants for various microspores of

[continuation of I-CH'UAN HSUEH-PAO No 4, Dec 76 pp 277-285]

hybrid F<sub>1</sub> were identical. No obvious competition among pollens with different genotypes was observed during culture. Two new varieties of keng rice were obtained by means of pollen haploid plant breeding and have been put into seed propagation and distribution for practical production.

AUTHOR: None

ORG: 304 Research Group, Institute of Genetics, Academia Sinica

TITLE: "Selection of Earliness and Development Expression of Spring Wheat K'o Ch'un 14"

SOURCE: Peking I-CH'UAN HSUEH-PAO [ACTA GENETICA SINICA] in Chinese Vol 3, No 4, Dec 76 pp 286-292

TEXT OF ENGLISH ABSTRACT: The spring wheat, K'o Ch'un 14, which has the character of early maturity, wide adaptation, and better yield performance is developed from the cross between spring wheat Oujou and winter wheat Peking 8. During its development, types of earliness, selection of early maturity of spring wheat by using methods of hybridization between spring wheat and winter wheat, performance of earliness under various stages of growth and development were observed and studied. On the basis of multiple location tests, the traits of this variety in the stages of growth and development in Northern China and the adaptability under winter souring were analyzed.

(1) In the past, study on the genetic transformation of early maturity was carried out partially on the date of ear emergence. At present, inheritance of the character of filling should be duly investigated.

[continuation of I-CH'UAN HSUEH-PAO No 4, Dec 76 pp 286-292]

(2) Spring wheat with better quality (high yields and early maturity) could be selected by using the procedure of ecological distant hybridization of spring wheat and winter wheat.

In the cross between spring and winter wheat, date of ear formation in  $F_1$  and  $F_2$  generations is later than that of the spring parent. But transgressive variation in early maturity will be observed after  $F_3$  and  $F_4$  generations.

(3) Rich experiences have been accumulated in shortening the breeding cycle of wheat in China by growing plants in South China in winter, at high elevation in summer, or in greenhouses. The difference due to provocative factors under various growth conditions (mainly light and temperature) would be used for the increase of the selection effect.

AUTHOR: None

ORG: Group of Genetics, Department of Biology, Szechuan University

TITLE: "The Study of the Artificial Induction of Gynogenetic Haploids of Rape"\*

SOURCE: Peking I-CH'UAN HSUEH-PAO [ACTA GENETICA SINICA] in Chinese Vol 3, No 4, Dec 76 pp 293-298

TEXT OF ENGLISH ABSTRACT: The artificial gynogenesis in rape was induced by interspecific pollination, and the gynogenetic haploids were produced. The induced gynogenetic haploids of rape were similar to the mother plant in shape, but usually smaller. Their leaves and flowers were also smaller. The stomata of the lower leaf epidermis were smaller. The number of chloroplasts in the guard cells was fewer. The chromosome number of the body cells was  $n=19$ . The following characters, such as the cotyledon form, the leaf hair, and the color of the seedlings, were used as markers in the determination of the gynogenetic haploids of rape in their early stage of development. By the use of daily cultivation and artificial supplementary pollination, the yield of rape haploids was increased, and some homozygous seeds of the inbreeding lines were obtained. In order to count the chromosome number, we suggested a simple method, which may be applied to the mass movement of the haploid plant breeding work.

\*Taking part in the work were LUO P'eng [5012 7720], LIAO Yen-hui [1675 5888 1979], LAN Tse-ch'u [5663 3419 5698], LIU T'ien-lun [0491 1131 0243], et al.

AUTHOR: None

ORG: Institute of Crop Breeding, Academy of Agricultural Science of Liaoning Province

TITLE: "A Preliminary Study on the Hereditability and Correlations of Main Characters in Kaoliang"

SOURCE: Peking I-CH'UAN HSUEH-PAO [ACTA GENETICA SINICA] in Chinese Vol 3, No 4, Dec 76 pp 303-308

TEXT OF ENGLISH ABSTRACT: Kaoliang is the most important crop in Liaoning province, and the present paper is referred to the fundamental research for its breeding.

The field trials were carried on with 20 varieties during 1964-1965 and randomized blocks for experiment field were designed. The coefficient of genetic variability and hereditability of 17 main characters were calculated by applying various formula of variance analysis respectively. The genotypic and phenotypic correlation between 14 main characters and seed yield per plant were also calculated respectively. The results obtained in 1965 were shown approximately in accordance with those of 1964.

[continuation of I-CH'UAN HSUEH-PAO No 4, 1976 pp 303-308]

The coefficient of genetic variability of various characters are of great difference from one another. For instance, in 1964, the coefficient of ear-axis length was 94.06% and that of stem-diameter was 8.92%, i.e. there presented a great deal of differences among various characters.

The experimental results worked out that the large range of variation for ear-length, length of ear-axis, length of ear-stalk, branchlets of ear, number of grain per ear and weight of grains per ear in heredity makes the characteristics which we desire easily obtained through crossing and selection.

The highest heritability was shown in 99.12% for growth phase (mean of two years), and the next 98.81% for ear-length, 97.19% for length of ear-axis and 96.15% for stem height. It is evident that these characters should be selected according to the phenotype of plant. On the other hand, the lower heritability for grain number per ear (75.77%) and seed yield per plant (79.22%) were manifested. It seems that selection should not be made according to the phenotype of plant.

This study also indicated that there is a significant positive correlation between stem-height, diameter of ear-stalk, diameter of ear, grain number per ear, number of node, weight of 1,000 grains and seed yield per plant respectively, whereas the correlation between length of ear-stalk and seed yield per plant is negative.

AUTHOR: CH'EN Yi-feng [7115 1355 1496]  
LUO Li-hua [5012 7787 5478]  
SUNG Chi-chih [1345 4949 1807]  
SHAN Hsiang-nien [0830 6116 1628]

ORG: Yunnan Zoological Institute, Kunming

TITLE: "Giemsa Banding Pattern Analysis of Chromosomes of Macaca mulatta"

SOURCE: Peking I-CH'UAN HSUEH-PAO [ACTA GENETICA SINICA] in Chinese Vol 3, No 4, Dec 76 pp 309-312

TEXT OF ENGLISH ABSTRACT: The investigation was made to study the distribution of the Giemsa bands in chromosomes of cultured peripheral blood lymphocytes from M. mulatta by a modified trypsin technique. The results show that each homologous pair has its own special banding pattern permitting to distinguish all the 20 pairs of autosomes and 2 sex chromosomes in the karyotype. The No 1, 2, 3, 4, 5, 6, 9, 10, 15, 17, 20 and Y chromosome have obvious marked Giemsa staining bands. Therefore, each of them is easily recognizable. Idiograms of standard chromosome complements were constructed, and all bands were diagrammatically represented.

AUTHOR: None

ORG: Ch'ing-tao Agricultural Research Institute

TITLE: "The Self-Incompatibility Selection and Heterosis Utilization in Chinese Cabbage"

SOURCE: Peking I-CH'UAN HSUEH-PAO [ACTA GENETICA SINICA] in Chinese Vol 3, No 4, Dec 76 pp 313-318

TEXT OF ENGLISH ABSTRACT: Chinese cabbage of Chiao-tung origin was used as major material for self-incompatible-line selection and heterosis utilization. The primitive results obtained are presented as follows:

(1) A part of superior self-incompatible F<sub>1</sub> hybridized combinations were selected;

(2) 283 individual plants of 36 varieties have been subjected to self-incompatibility test, the ratio of F<sub>1</sub> self-incompatible plants were found to be 17.8%. It was found that the lower the index of self-incompatibility the higher the ratio of incompatible plants occurred in the progeny, but not without exceptional cases;

[continuation of I-CH'UAN HSUEH-PAO No 4, Dec 76 pp 309-312]

(3) The self-incompatibility was heritable, which occurrence and stability differed according to different varieties and strains;

(4) Degeneration occurred after self-fertilization, the more self-fertilized the more seriously degenerated in its succeeding generations;

(5) Self-incompatibility selection should be closely hinged with the combining ability test, with a view to reduce the time used for breeding;

(6) In using the self-bred line for combining the F<sub>1</sub> hybrids, the interlinear natural hybridization rate which exceeds 97% should be positively utilized.

AUTHOR: SUN Hsu-ch'u [1327 2485 0443]

ORG: Agricultural Science Research Institute of Liuan District, Anhwei

TITLE: "Studies on the Genetic Regulation of Main Economical Characters of the Rice Type Oryza Sativa Subsp. Hsien\*--I. Test of Genetic Variation and Its Correlation to the Main Economical Characters of the Parental Varieties"

SOURCE: Peking I-CH'UAN HSUEH-PAO [ACTA GENETICA SINICA] in Chinese Vol 3, No 4, Dec 76 pp 319-324

TEXT OF ENGLISH ABSTRACT: At present, the rice breeding by hybridization, concerning either the choice of parental materials for crossing or the selection of plants in segregating generations, is lack of theoretical guidance. This article is the first part of the studies which dealt with the genetic regulation of the main economical characters in the rice type Oryza sativa subsp. Hsien. From 14 parental varieties, the coefficient of variation, heritability and correlation coefficient of the important characters were estimated and investigated.

According to the estimation, C. V. of the same character in different varieties tended to be unanimous. The order of average C. V. of different characters appeared as follows: (ascending) days of spiking → length of plant → weight

[continuation of I-CH'UAN HSUEH-PAO No 4, Dec 76 pp 319-324]

per 1,000 grains → length of spike → total grains per spike → total tillerings per spike → effective tillerings per plant → output of individual plant empty husks per spike.

Heritability of different characters tended to be in inverse to C. V. of the characters. The order appeared as follows: (descending) length of plant days of spiking → weight per 1,000 grains → length of spike → total grains per spike → empty husks per spike → total tillerings per plant → effective tillerings per plant → output of individual plant.

It was also found that there were 11 pairs of characters which appeared evident or most evident in their expressions of correlation, and only in total tillerings and effective tillerings appeared an evident correlation with the output of individual plants.

\*During the course of the study, comrades KUAN ch'uan-hsi [4619 0278 4406], CH'EN Shih-ku [7115 1709 6253], CH'EN Li [7115 0500], et al., participated in various parts of the work; furthermore, special thanks is given to comrade CHAO Lun-yi [6392 0243 0001] for his valuable opinions.

8650

CSO: 4009

ACTA ASTRONOMICA SINICA

AUTHOR: LI Hsiao-ch'ing [2621 2556 1615]

ORG: Purple Mountain Observatory, Academia Sinica

TITLE: "Discrete Space-Time and Red-Shifts of Galaxies"\*

SOURCE: Peking T'IEN-WEN HSUEH-PAO [ACTA ASTRONOMICA SINICA] in Chinese Vol 17, No 2, Dec 76 pp 129-133

TEXT OF ENGLISH ABSTRACT: Motion is the essential property of space and time. The unique uniform velocity of photons suggests a picture of discrete space-time, since uniformity in motion is a direct property of discreteness.

Starting from this point, we describe the motion of photons by equation (6). We succeed in proving that the motion of photons under its own force field is damped. This damping is caused by the decay of photon energy as a result of action of its own force field. Hence we obtain the well known Hubble formula (11). This result suggests that the red-shifts of galaxies are direct results of photon motion in the discrete space-time under photon's own force field.

\*Received 12 Jan 1976

AUTHOR: FANG Li-chih [2455 0536 0037]

CHOU Yu-yuan [0719 0642 0337]

CH'ENG Fu-chen [4453 4395 5271]

CH'U Yao-ch'uan [5969 5069 3123]

ORG: University of Science and Technology of China

TITLE: "A Statistical Analysis for Quasars With Radio Components Structure. I. Redshift-Magnitude Relation"\*

SOURCE: Peking T'IEN-WEN HSUEH-PAO [ACTA ASTRONOMICA SINICA] in Chinese Vol 17, No 2, Dec 76 pp 134-136

TEXT OF ENGLISH ABSTRACT: In this paper a statistical investigation has been made on the redshift-magnitude relation of quasars with radio components structure. The main results are summarized in the following way:

1. The largest distance  $D$  between components is an important parameter which can be employed to classify the "standard candle."
2. Seeing that the regression equations with high correlation coefficient among redshifts, apparent magnitude and  $D$  have been established, it may be true that the redshift of these quasars is mainly cosmological.



[continuation of T' IEN-WEN HSUEH-PAO No 2, Dec 76 pp 134-136]

3. It has been found that the redshift-distance relation may be expressed as  $r_{\infty} z - 0.19z^2$  which departs apparently from Hubble's linear relation in the range of  $z > 1$ .
4. The redshift-magnitude relation given by the new redshift-distance relation looks better than Hubble's for radio galaxies as well.
5. The optical luminosity of quasars decreases as the value of  $D$  increases.

\*Received 24 Nov 1975

AUTHOR: TSOU Chen-lung [6760 2182 7127]  
CH'EN Shih [7115 25142]  
HO Tso-hsiu [0149 4373 1652]  
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ORG: TSOU of Peking Observatory, Academia Sinica; CH'EN, HO, KUO of Institute of High Energy Physics, Academia Sinica

TITLE: "A Spherically Symmetric Star Model in the Gravitational Gauge Theory"\* \*\*

SOURCE: Peking T' IEN-WEN HSUEH-PAO [ACTA ASTRONOMICA SINICA] in Chinese Vol 17, No 2, Dec 76 pp 147-156

TEXT OF ENGLISH ABSTRACT: In this paper, we shall show that a star model, which is black hole-free and singularity-free, can be obtained naturally in the gravitational gauge theory, provided the space-time is torsion-free and the matter is spinless.

Our conclusion is a sense show that the discussions about the black hole and the singularity based on the general relativity may not describe the nature correctly.

\* Presented at the September 1975 Nanking conference on the physics of heavenly bodies.

\*\* Received 18 Feb 1976.

AUTHOR: CH'U Yu-hua [0443 3022 2901]

ORG: Purple Mountain Observatory, Academia Sinica

TITLE: "Hot Ultrashort Period Cepheid--A New Type Variable in Globular Cluster M15"\* \*\*

SOURCE: Peking T'IEN-WEN HSUEH-PAO [ACTA ASTRONOMICA SINICA] in Chinese Vol 17, No 2, Dec 76 pp 157-164

TEXT OF ENGLISH ABSTRACT: The star No 1082 in Kustner Catalogue of M15 is a new type variable. Its period is 0.087 004 and amplitude is about 0.2 It has a B-V color index +0.10. This makes its position on the color magnitude diagram go out of the hot border of  $\delta$  Scuti stars. We classify it temporarily as a hot ultrashort period Cepheid. So the hot Cepheids may be a sub-type of the Population II ultrashort period cepheids.

\*Received 30 Apr 1976.

\*\*Comrade HSIA Ch'ang-li [1115 2490 4539] took part in some of the measurements and calculations of the present article.

AUTHOR: TAI Wen-sai [2071 2429 6357]

ORG: Department of Astronomy, Nanking University

TITLE: "An Interpretation of the Distribution of Angular Momentum in the Solar System"\*

SOURCE: Peking T'IEN-WEN HSUEH-PAO [ACTA ASTRONOMICA SINICA] in Chinese Vol 17, No 2, Dec 76 pp 165-175

TEXT OF ENGLISH ABSTRACT: An interpretation of the present peculiar distribution of angular momentum in the solar system is given: before entering the main sequence, the sun while undergoing gravitational contraction lost most of its angular momentum; but the bulk of matter ejected by the sun did not enter the nebulous disk. The planetary material already possessed enough angular momentum, and did not need the sun to transfer angular momentum to it. In explaining the peculiar distribution of angular momentum, an attempt is also made to describe quantitatively the early stage of the formation process of the solar system.

\*Received 1 Jun 1976.

AUTHOR: CH'EN Tao-han [7115 6670 3352]  
WU Chih-hsien [2976 1807 6343]  
YANG Hsiu-yi [2799 0208 5030]

ORG: Purple Mountain Observatory, Academia Sinica

TITLE: "The Motion of Eros' Rotation Axis in Space"\*

SOURCE: Peking T'IEN-WEN HSUEH-PAO [ACTA ASTRONOMICA SINICA] in Chinese Vol 17,  
No 2, Dec 76 pp 176-184

TEXT OF ENGLISH ABSTRACT: A new method for pole determination of Eros, based upon our mathematical model, is presented. Utilizing formulae (1)-(5), we obtain the pole of different years as shown in Fig. 3. In searching for the coordinates of the pole by electronic computer from observational materials, we apply the condition that  $\delta$  must be a minimum value.

It is shown that the direction of Eros' rotation has undergone considerable change in a time scale of one month. Obviously, it is due to nutation.

Also, we have obtained the following results:

1. The theoretical amplitude-aspect relation is shown as (12). Its comparison with the actual relation corresponding to various poles is shown in Fig. 4.

[continuation of T'IEN-WEN HSUEH-PAO No 2, Dec 76 pp 176-184]

2. A length of 0."17 at a geocentric distance of 0.176 a.u., with correction for foreshortening, gives Eros a length of approximately 22 km.

3. Eros is rotating counter-clockwise as seen from its north pole, thus Eros is rotating directly.

\*Received 27 Nov 1975.

AUTHOR: P'ENG Ch'iu-ho [1756 4428 0735]  
WANG Hsueh-wei [3769 1331 3634]\*\*  
WANG Ts'un-ts'ang [3769 1317 0221]\*\*  
SUN Sheng-tz'u [1327 4141 1964]\*\*  
CHU Ts'ui-lien [2612 5050 5571]\*\*

ORG: Department of Geophysics, Peking University

TITLE: "Maxima of the Brightness and Areas of Solar H Flocculi in January-April 1971 and Their Correlations With Flares"\*

SOURCE: Peking T'IEN-WEN HSUEH-PAO [ACTA ASTRONOMICA SINICA] in Chinese Vol 17, No 2, Dec 76 pp 185-192

TEXT OF ENGLISH ABSTRACT: This paper presents a statistical study of the daily maximum brightness, areas and other parameters of the  $H_{\alpha}$  flocculi of all the active regions on the solar surface in the period January-April 1971 as well as flare outbursts. The statistics show that there are some correlations between the maxima of the parameters (especially the brightness) of flocculi and flares. Within five days before the appearance of the flares under investigation, the brightness of the corresponding flocculi exhibited maxima. In three days ahead of flares, the focculi corresponding to 92.8% of the flares underwent brightness maxima.

[continuation of T'IEN-WEN HSUEH-PAO No 2, Dec 76 pp 185-192]

Besides these, the statistics tell us that flocculi brightness may have 1-2<sup>d</sup> periodic changes before the outbursts of flares. This probably means that the magnetic fields in active regions have similar variations. It is possible that this reflects some intrinsic physical connections among the maxima of flocculi brightness, magnetic fields and flares.

\*Received 19 Feb 1976.

\*\*Worker, peasant and soldier students class of 1975.

AUTHOR: SHIH Chung-hsien [0670 1813 0341]  
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CH'EN Ch'uan-yue [7115 0278 2867]  
CHANG Shan-li [1728 0810 4409]  
WANG Chien-min [3769 1696 3046]\*\*

ORG: Peking Observatory, Academia Sinica

TITLE: "A Comparison of the Solar Optical Observatory Testing Sites at  
Sha-ho, Hsing-lung and Huai-jou"\*

SOURCE: Peking T'IENT-WEN HSUEH-PAO [ACTA ASTRONOMICA SINICA] in Chinese Vol 17,  
No 2, Dec 76 pp 193-202

TEXT OF ENGLISH ABSTRACT: This paper describes the results of comparison of  
the solar optical observations carried out by us in May-July 1975 at three  
typical topographies: plain countryside (Sha-ho Station), mountains (Hsing-  
lung Station) and water surface (Huai-jou Reservoir). At fixed hours we  
photographed the fine structures (granulation) on the solar surface, and there  
have been obtained thirty thousand and more photographs. According to the  
quality of images they can be divided into six classes. For the first to  
third classes, which correspond to the comparatively superior quality, Huai-jou  
shares the portion 24%, Hsing-lung -- 12.7%, and Sha-ho -- 7.5%. Water surface

[continuation of T'IENT-WEN HSUEH-PAO No 2, Dec 76 pp 193-202]

is evidently superior to mountains and plain countryside. For details see  
Tables 3, 4, 5.

In the aperture range  $1'.5 \times 1'$ , all three sites could yield photographs  
attaining the limiting resolution of instrument ( $0.''9$ ). For such photographs  
Huai-jou occupies 1.3%, Hsing-lung -- 0.8%, Sha-ho -- 0.1%. The time inter-  
val of consecutive appearance of these photographs at Huai-jou is a little  
longer than 1 second.

\* Received 18 Dec 1975.

\*\*Some comrades of the Solar Physics Laboratory also participated in some of  
the test site work.

AUTHOR: None

ORG: The Astrolabe Division, Shanghai Observatory, Academia Sinica

TITLE: "The Diurnal Variation of Latitude and Longitude Obtained With an Astrolabe"\*

SOURCE: Peking T'IEN-WEN HSUEH-PAO [ACTA ASTRONOMICA SINICA] in Chinese Vol 17, No 2, Dec 76 pp 203-208

TEXT OF ENGLISH ABSTRACT: From the analysis of the difference between two neighboring groups obtained with an astrolabe in the same night, the existence (with regard to both latitude and longitude) of the rate of change of the difference between two neighboring star groups is discovered. A study of the rule of the diurnal variation of latitude and longitude, obtained with the astrolabe in Shanghai, leads us to the hypothesis that the diurnal variation of latitude and that of longitude are the two components of the displacement of the apparent zenith.

\*Received 18 Feb 1976.

AUTHOR: None

ORG: Astronomical History Research Group, Shan-hsi Observatory, Academia Sinica

TITLE: "The First Astronomical Geodetic Survey in the History of China and Its Significance--Concerning CHANG Sui's [1728 6659] (YI Hsing's [0001 5887]) Meridian Measurement"\*

SOURCE: Peking T'IEN-WEN HSUEH-PAO [ACTA ASTRONOMICA SINICA] in Chinese Vol 17, No 2, Dec 76 pp 209-216

TEXT OF ENGLISH ABSTRACT: An astronomical geodetic survey was organized by CHANG Sui (YI Hsing), the Tang Dynasty astronomer, more than 1,200 years ago. The method of measurement and the surveying work are described, and the results of measurement are analyzed. On the basis of the scientific value of this survey and the practical effect it produced, the significance of this study is discussed.

\*Received 14 Jan 1976.

AUTHOR: None

ORG: Ancient Sunspot Records Research Group, Yunnan Observatory, Academia Sinica

TITLE: "An Arrangement of Records of Sunspot in Our Past Generation and an Investigation of Their Active Periods"\*

SOURCE: Peking T'IEN-WEN HSUEH-PAO [ACTA ASTRONOMICA SINICA] in Chinese Vol 17, No 2, Dec 76 pp 217-227

TEXT OF ENGLISH ABSTRACT: In this paper, the records of sunspots in our past generations were collected and arranged. For them the correlation analysis has been made. Three possible periods of large sunspot activity have been obtained. They are  $10.60 \pm 0.43$  years,  $62.2 \pm 2.8$  years and about 250 years. The first agrees with the well-known period of 11 years.

\*Received Dec 1975.

AUTHOR: HSIUNG Ta-jun [3574 1129 7032]  
SU Hung-chun [5685 3163 6874]  
HUANG Ch'ang-ch'un [7806 7022 2504]

ORG: Purple Mountain Observatory, Academia Sinica

TITLE: "Polarization Observations of Nova Cygni 1975"\*

SOURCE: Peking T'IEN-WEN HSUEH-PAO [ACTA ASTRONOMICA SINICA] in Chinese Vol 17, No 2, Dec 76 pp 228-231

TEXT OF ENGLISH ABSTRACT: Polarimetric observations of Nova Cygni 1975 are presented. Its circular polarization was not detected. Its linear polarization is about 1.2% in yellow light and 1.1% in blue light, both of which show no detectable time variations. This polarization may be of interstellar origin.

\*Received 7 Jan 1976.

ACTA ASTRONOMICA SINICA

AUTHOR: SU Ting-chiang [5685 1353 1730]  
YU Hsin-mu [0205 2450 2606]  
WANG Lan-chuan [3769 5695 1227]  
HSIEH Chih-feng [0673 4460 7364]

ORG: SU and YU of the Nan-ching Astronomical Instrument Factory, Chinese Academy of Sciences; WANG and HSIEH of the Shang-hai Observatory, Chinese Academy of Sciences

TITLE: "Automatic Design of Corrector Systems for Cassegrain Telescopes"

SOURCE: Peking T'IEN-WEN HSUEH-PAO [ACTA ASTRONOMICA SINICA] in Chinese Vol 17, No 1, Jun 76 pp 9-26

TEXT OF ENGLISH ABSTRACT: According to the method described in reference [1], we have designed a series of corrector systems for Cassgrain telescopes automatically with the use of an electronic computer. The calculations were carried out under the following two conditions: The primary and secondary mirrors have strictly conical surfaces, and the telescope is strictly free from third-order spherical aberration when corrector systems are taken off. Results in this paper can be converted proportionally to real telescope with any size of aperture, but the aberrations expressed in seconds of arc remain unchanged.

[continuation of T'IEN-WEN HSUEH-PAO No 1, Jun 76 pp 9-26]

Received for publications 1 Nov 75.

[1] After this report was completed we saw a draft review of the general principle for constituting the mathematical function of B. Brixner. It is very similar. See: Brixner, B., APPL. OPT. 2(1963) 1281 and 12(1973) 2709.



AUTHOR: None

ORG: Astrolabe Division, Shanghai Observatory, Chinese Academy of Sciences

TITLE: "An Analysis of the Data Derived From the First Year Observations With the Photoelectric Astrolabe Type II"

SOURCE: Peking T'IEN-WEN HSUEH-PAO [ACTA ASTRONOMICA SINICA] in Chinese Vol 17, No 1, Jun 76 pp 27-33

TEXT OF ENGLISH ABSTRACT: A comparison of the results obtained by the Photoelectric Astrolabe Type II made in China and the Danjon Astrolabe, according to the same program for one year, has been made at the Shanghai Observatory. An analysis of the observations of these two instruments reveals that the accuracy of the Photoelectric Astrolabe Type II is higher than the Danjon Astrolabe in all respects.

In this paper, data of experimental observations have been used in the analysis of the influence of the short period fluctuation of temperature on the results of time determination and in the calculation of the effect of the Lunar Tide terms on the time and latitude observations. The  $\Delta_{\alpha\delta}$  and the  $\Delta\delta\delta$  type systematic errors of FK4 by the single instrument are given. Received for publication 11 Dec 75.

AUTHOR: CH'U Ch'in-yueh [2575 2953 1471]  
WANG Chen-ju [3076 3791 1172]

ORG: Department of Astronomy, Nan-ching University

TITLE: "Stellar 'Superflare' Model for Cosmic  $\gamma$ -Ray Burst"

SOURCE: Peking T'IEN-WEN HSUEH-PAO [ACTA ASTRONOMICA SINICA] in Chinese Vol 17, No 1, Jun 76 pp 34-40

TEXT OF ENGLISH ABSTRACT: The following model has been suggested for cosmic  $\gamma$ -ray burst: Cosmic  $\gamma$ -ray burst is an event analogous to solar flare, but much more drastic in scale; the magnetic energy stored in stellar "superflare" is converted into kinetic energy of electrons during burst; a great number of relativistic electrons rush out from stellar "superflare" within a very short time; inverse-compton photons are produced in the collision between these relativistic electrons and the ambient photons which have been emitted from the stellar photosphere, and then an event of  $\gamma$ -ray burst occurs. According to this model, the expressions of time structure, energy spectrum and so forth of the cosmic  $\gamma$ -ray burst have been deduced and have been applied to the event which occurred on 27 April 1972. The results of calculation show that "superflare" in magnetic white dwarf may be the "source" of the cosmic  $\gamma$ -ray burst. Received for publication 5 Jul 75.

AUTHOR: None

ORG: Sinkiang Solar Eclipse Coordinated Observation Group

TITLE: "A Summary Report on the Coordinated Optical, Radio, Geomagnetic and Ionospheric Observations of the Solar Eclipse of 22 September 1968 in Sinkiang"

SOURCE: Peking T' IEN-WEN HSUEH-PAO [ACTA ASTRONOMICA SINICA] in Chinese  
Vol 17, No 1, Jun 76 pp 41-59

TEXT OF ENGLISH ABSTRACT: This paper summarizes the main results obtained from the coordinated optical, radio, geomagnetic and ionospheric observations of the solar eclipse in Sinkiang.

1. Photographs of the corona at various wavelengths were taken during totality. The brightness distribution and polarization were photometrically studied, and the electron density and temperature of the equatorial zone for the range 1.1-3.5  $R_{\odot}$  were derived.
2. Good photographs of a coronal condensation region were taken; Through photometric measurement its brightness distribution and polarization were studied. It was shown that the maximum electron density in the center of the

[continuation of T' IEN-WEN HSUEH-PAO No 1, Jun 76 pp 41-59]

condensation is about  $7.7 \times 10^9 \text{ cm}^{-3}$  which was 7-8 times than in the surrounding undisturbed corona. The deviation angles of the direction of polarization in the condensation region were systematically greater than in the surrounding undisturbed corona.

3. From the analysis of the radio observations at wavelength 3.2, 11.1 and 21 cm we derived the following parameters of the local sources: flux density, one-dimensional size, height, brightness temperature, magnetic field and spectrum. The polarization observation at wavelength 3.2 cm showed that the sunspot No 332 and the polarization source associated with it have one to one correspondence in their nucleus-penumbra formation. The smallest separation between the double nuclei of the polarization source was about  $2.''5$ . The electron density distribution and the temperature distribution in the chromosphere-corona transition region for two sources were derived from the observed spectrum.

4. The analysis of the eclipse effect on the geomagnetic field showed that this effect was less than  $5\gamma$ . In order to explain this effect the electric-current system at about 110 km in the E-layer was calculated.

[continuation of T'IEN-WEN HSUEH-PAO No 1, Jun 76 pp 41-59]

5. The eclipse changes in the critical frequency  $f_o E$  of the E-layer were observed the maximum decrease of the  $f_o E$  caused by the eclipse was about 0.8 MHz. Based on the "classical" method of eclipse analysis, the relative intensity distribution of the ionizing radiation sources on the Sun were derived, and the correlation between the ionizing radiation sources and the radio-optical activity was discussed.

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ORG: Yunnan Observatory, Chinese Academy of Sciences

TITLE: "A Discussion of Correlations Between Spiral Morphology of Sunspot Penumbra and High Energetic Flares"

SOURCE: Peking T'IEN-WEN HSUEH-PAO [ACTA ASTRONOMICA SINICA] in Chinese  
Vol 17, No 1, Jun 76 pp 60-80

TEXT OF ENGLISH ABSTRACT: The present paper is concerned with a preliminary statistical analysis of the photographical morphology of sunspot groups observed at Yunnan Observatory during March 1970-December 1972.

1. There exists a higher frequency ( $\geq 55\%$ ) of flare production in those regions in which persistent ( $\geq 2$  days) penumbral spiral structure is observed.

[continuation of T'IEN-WEN HSUEH-PAO No 1, Jun 76 pp 60-80]

2. There is a close correlation ( $\sim 84\%$ ) between the above mentioned regions and energetic flares.

3. About 90% of energetic flares in the above mentioned regions appeared in average of 3.8 days later after the occurrence of spiral spots. A possible cause and effect relation may exist in these phenomena.

The above conclusions may be useful in the construction of a flare theory with reference to twisting instability of magnetic field.

12 photographs.

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TITLE: "Meter Wavelength Characteristics of a Solar Active Region in August 1972"

SOURCE: Peking T'IEN-WEN HSUEH-PAO [ACTA ASTRONOMICA SINICA] in Chinese Vol 17, No 1, J-n 76 pp 81-92

TEXT OF ENGLISH ABSTRACT: Some results of measurements made in August 1972 of the solar radio bursts and the Type-I source associated with the active region 238 (McMath 11976) have been obtained at Miyun station, Peking Observatory (working frequency 146 MHz).

[continuation of T'IEN-WEN HSUEH-PAO No 1, Jun 76 pp 81-92]

We describe in the first part of this paper the observations of radio bursts at 146MHz during the period in which the active region moved across the solar disk.

In the second part of this paper the results of measurements are analyzed and compared with the associated S-components in centimeter wavelengths. It is found that the daily variations of the Type-I source are correlated with those of the S-components with 2-day time-delay. This evolutionary relation could be a result of emergence of some non-potential magnetic fields imbedded in slowly moving ( $\approx 1$  km/s.) electronic plasma clouds.

From measurements of the angular extent of Type-I source, strengths of the background magnetic fields are estimated.

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TITLE: "New Orbits of P/Tsuchinshan 1 and P/Tsuchinshan 2 and Ephemerides of Their Return 1977-1979"

SOURCE: Peking T'IEN-WEN HSUEH-PAO [ACTA ASTRONOMICA SINICA] in Chinese Vol 17, No 1, Jun 76 pp 106-109

TEXT OF ENGLISH ABSTRACT: We employed nearly all the observations in 1965 and in 1971-1972 of P/Tsuchinshan 1 and P/Tsuchinshan 2 to improve their orbits, with the perturbations of all the major planets taken into account. With the new orbital elements thus obtained, the opposition ephemerides of their coming return during 1977-1979 have been calculated. (Part of the observational data have been communicated to us by Dr E. Roemer before their publication).

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TITLE: "Critical Review of Theories on the Origin of the Solar System"

SOURCE: Peking T'IEN-WEN HSUEH-PAO [ACTA ASTRONOMICA SINICA] in Chinese  
Vol 17, No 1, Jun 76 pp 93-105

TEXT OF ENGLISH ABSTRACT: Forty theories on the origin of the solar system are critically reviewed, especially with regard to the two fundamental problems: source of planetary material and mode of planetary formation. The following conclusions are drawn: planetary material was neither captured by nor expelled from the sun; the whole solar system was formed from a nebula, as postulated by Kant and Laplace, but their nebular theories need revision and development. A nebular disk was formed around the sun, in it planets and satellites were formed. The planets were not formed in rings, not through huge protoplanets, not through some intermediate bodies, not in a regular pattern of turbulent eddies. Dust and ice particles first coagulated to form planetesimals, then planetesimals accumulated to form planets. Dust and ice particles first

[continuation of T'IEN-WEN HSUEH-PAO No 1, Jun 76 pp 93-105]

sank to the equatorial plane, the density being increased, the process of planetary formation was greatly speeded up. Rotation of planets did not originate as a result of solar tidal action on huge protoplanets, but as a result of impact of planetesimals on planetary embryos.

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TITLE: "A Suggestion About Criterion of the Quality of Solar Proton-Event Forecasts"

SOURCE: T'IEN-WEN HSUEH-PAO [ACTA ASTRONOMICA SINICA] in Chinese Vol 17, No 1, Jun 76 pp 115-117

TEXT OF ENGLISH ABSTRACT: An improved indicator for estimating the quality of solar proton-event forecasts is suggested.

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TITLE: "Some Supplementary Analyses of Solar Active Region in August 1972"

SOURCE: Peking T'IEN-WEN HSUEH-PAO [ACTA ASTRONOMICA SINICA] in Chinese Vol 17, No 1, Jun 76 pp 110-114

TEXT OF ENGLISH ABSTRACT: We have probably observed the phenomena of transfer of penumbral vortical pattern between two sunspots in a solar active region in August 1972. We compared our observations with those of Zirin and Tanaka. Some new phenomena have been found.

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Contains 13 sketches: phases of action for 31 July, 1, 2, 3, 4, 5, 6, 7, 8, 9 August and as seen through a colored sphere 2, 3, 5. August.

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